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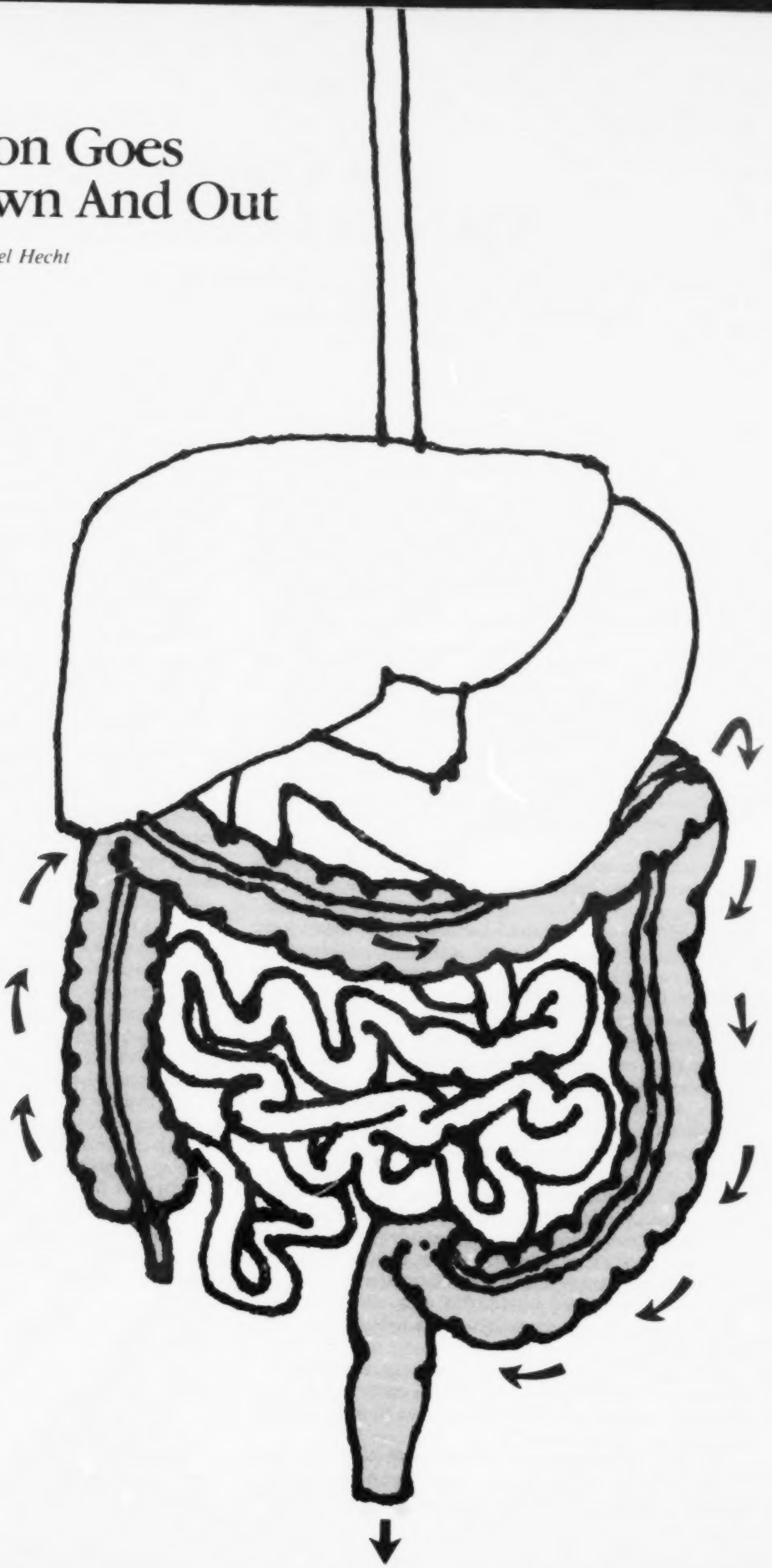
The Colon Goes Up, Over, Down And Out

by Annabel Hecht



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by Annabel Hecht

The colon is one organ of the body not likely to be mentioned in romantic literature. In fact, it is a part of the anatomy most people would probably rather not talk about, considering what it does.

Situated at the nether end of the digestive tract, the colon is the final loop in the journey of food through the gastrointestinal system. The colon has two primary functions: (1) the final absorption of fluids and electrolytes (sodium, potassium, chloride and bicarbonate) from the undigestible food residues, and (2) the storage of the semisolid remains, called feces or stool, until they are evacuated.

Although it is relatively short—only a fifth of the total length of the intestinal canal—the colon is the site of a surprising variety of discomforting and sometimes life-threatening disorders. Virtually no part of this organ is immune from disease, ranging from appendicitis at the point where the colon begins to hemorrhoids at the point where it ends. In between, the colon is beset by inflammatory and infectious diseases, polyps and, of course, cancer.

Here's a look at what can go wrong in the colon and what can be done about it:

Appendicitis is the most common cause of emergency abdominal surgery. The appendix literally hangs on the cecum (see accompanying article, "Anatomy of the Colon") and shares the contents of the colon. If it becomes obstructed, circulation is cut off, the appendix becomes inflamed, and appendicitis develops.

The so-called "classic" symptoms of appendicitis include pain, nausea or vomiting, sensitivity over the area of the appendix, and fever. However, not everyone has these symptoms. The only treatment is prompt removal of the appendix. Delay can lead to gangrene, rupture and peritonitis (inflammation in the abdomen).

Hemorrhoids are abnormally large conglomerates of blood vessels, supporting tissues, and mucous membranes in the anorectal area—that is, the anal canal and lower rectum. The human species gets hemorrhoids because of erect posture, heredity, occupation, diet, and cultural patterns. This often uncomfortable condition can be triggered by constipation, diarrhea, pregnancy, anal infection, and cancer of the rectum.

A variety of nonprescription, or over-the-counter (OTC), products are available to relieve the itching, burning, pain, inflammation, irritation, swelling, and discomfort of hemorrhoids. An FDA advisory panel on OTC drugs reviewed these products and made recommendations as to their safety and effectiveness.

More serious symptoms—bleeding, seepage, protrusion, prolapse (dropping down), and thrombosis (blood curdling)—should be treated by a physician who may decide to use one of a number of surgical procedures.

The entire colon or just parts of it can be affected by ulcerative colitis and Crohn's disease, two conditions frequently lumped together under the general term "inflammatory bowel disease."

Ulcerative colitis is a chronic disease marked by inflammation of the inner lining of the colon and rectum. In some cases, the entire colon is affected; in others, only the last segment (the sigmoid colon) and rectal areas are involved. The symptoms range from a small amount of rectal bleeding to severe diarrhea that can be disabling. Other symptoms include abdominal and rectal pain, weight loss, anemia, and loss of body fluids and minerals.

Ulcerative colitis typically affects young adults, with three-quarters of the cases developing before the age of 30. Young children and the elderly may also be victims. It was once thought to be a disease limited to the United States and Europe. However, it is being seen with increasing frequency in Japan, India, Thailand, and other countries in the Far East.

In about 60 percent of the cases, the disease is mild and attacks are intermittent—that is, they come and go. Some patients may have only one attack with no symptoms again for 10 or 15 years. In the moderate form, symptoms of the disease include diarrhea and low-grade fever. For 15 percent of the victims, the disease starts suddenly and doesn't let up. One of the worst symptoms is a severe bearing-down kind of pain with an inability to have a bowel movement. Deaths from ulcerative colitis are rare but can occur among those with a markedly inflamed and/or dilated bowel.

Ulcerative colitis was first described in 1875, yet its cause remains a mystery. It was once thought to be the result of an infection, because of its inflammatory nature, but no infectious agent has been identified. Another theory is that the disease has a genetic basis since additional cases of ulcerative colitis are frequently seen in families of victims.

The disease also has been attributed to emotional or psychological disorders, sensitivity to certain foods, or the phenomenon of "autoimmunity," in which the body's defense mechanisms attack its own tissues.

Most patients respond satisfactorily to medical treatment with no further problems. From 10 percent to 29 percent, however, develop complications such as hemorrhoids, pseudopolyps, and anal fissures. Major problems resulting from ulcerative colitis are toxic megacolon (acute dilation of the colon), perforated colon, massive hemorrhage, and cancer. The risk of developing cancer increases in cases lasting 10 years or more, when most of the colon is involved.

Complications of this disease can reach outside the colon. Inflammation of the small joints of the fingers, hands, feet, ankles, knees, and of the spine and sacroiliac joints sometimes occurs. Skin complications include erythema nodosum (raised, tender swellings on the arms and legs) or the more severe pyoderma gangrenosum, which starts out looking like boils and ends up as large gangrenous lesions.

The eyes and mouth also may become involved in a small number of cases. Blockage of the pulmonary artery in the lung resulting from a clot in the leg or pelvic vein is another complication,

as are some liver and kidney disorders. Children with ulcerative colitis do not grow at the normal rate.

Ulcerative colitis is usually diagnosed on the basis of the patient's medical history, examination of the stool, and direct examination of the diseased area through optical instruments called endoscopes. X-rays, blood counts, and other blood analyses may be used, although there are no specific laboratory tests for ulcerative colitis. The diagnosis can be complicated in that a number of intestinal diseases may mimic ulcerative colitis.

Treatment of this disease must be tailored to the individual patient's needs. Medical therapy is directed toward correcting malnutrition and loss of blood, fluids and electrolytes, and controlling inflammation with steroid medications (prednisone, hydrocortisone and others) and sulfasalazine. While such drugs offer relief from symptoms, they do have a number of undesirable side effects, and they do not cure the disease.

The only sure cure is surgical removal of the colon, an option usually reserved for high-risk patients who have not been helped by other treatments. Known as proctocolectomy, this operation leaves the patient with a permanent ileostomy, an artificial opening to which the ileum (the last segment of the small intestine) is attached. Liquid bowel waste empties into a disposable bag attached over the new opening. Most patients who undergo this operation can lead a reasonably normal life and eat a normal diet. There are studies under way examining a new surgical procedure, called endo-rectal pull-through, which will connect the ileum to the rectum and avoid an ileostomy.

Two diseases that mimic ulcerative colitis are amebic dysentery and shigellosis. Amebic dysentery is caused by a parasite and is very common in tropical countries. Cases are also seen with some frequency in the southwest, western and southern regions of the United States. Shigellosis is the infamous "Montezuma's revenge," which many a traveler to Mexico has encountered. Both conditions are treated with antibacterial agents such a metronidazole (Flagyl) or ampicillin.

Crohn's disease, the second of the conditions that constitute inflammatory bowel disease, shares many of the features of ulcerative colitis though it is generally believed to be a separate disease. It occurs throughout the world, with the greatest frequency among Europeans. It is more common among Jews, and it is seen more often in whites than non-whites.

Named for the doctor who first described it in 1932, Crohn's disease is characterized by a thickening and inflammation of all layers of the intestinal wall. Diseased portions of the intestine may be separated by normal tissue, giving rise to the term "skip lesions."

Unlike ulcerative colitis, Crohn's disease can attack any part of the alimentary canal, although the ileum and the colon are the most common sites.

Like ulcerative colitis, the cause of Crohn's disease is unknown. There is a familial connection in that patients often have relatives with either of the two diseases; recent observations suggest that it may be caused by an infectious agent. There is also some speculation that the body's immune mechanisms may be involved.

Diarrhea and abdominal pain are often the earliest signs of Crohn's disease. Joint pain, lack of appetite, weight loss, and fever are also common.

The course of the disease is unpredictable. Some patients' symptoms may be mild, though continuing for many years. In other cases, there may be a single attack followed by a long period without symptoms. Diagnosis may not be made until late in the course of the disease, and then it must be made by excluding infections with look-alike symptoms.

Small bowel obstruction, formation of fistulas, and mild bleeding are among the major bowel complications of Crohn's disease. (A fistula is an abnormal channel occurring between two loops of intestine or between the intestine and another structure such as the bladder, vagina or skin.) Systemic manifestations—those outside the immediate bowel area—are very similar to those associated with ulcerative colitis.

The treatment of Crohn's disease includes supportive measures such as bed rest and replacement of fluids, electrolytes and vitamins. Patients with severe or complicated disease may be fed intravenously to allow the bowel to rest. Drug therapy is similar to that of ulcerative colitis and includes steroids and sulfasalazine. Diseased portions of the bowel are not usually removed surgically, for the disease tends to recur in the remaining intestine. Surgery may be undertaken in more complicated cases, however, especially when obstruction is present.

Two common intestinal disorders that are often confused with the inflammatory bowel diseases are diverticulosis and irritable bowel syndrome.

Diverticulosis is common in developed Western societies, affecting by some counts as much as one-third of all people over the age of 50. Diverticulosis is not a disease per se but is a condition characterized by the presence of diverticula, or saclike outpouchings of the colon. For the most part, these pouchings, which occur most often in the sigmoid colon, cause no problems. But about 15 percent of persons with those pouches will develop an inflammation known as diverticulitis. This condition is found more often in men than women.

The symptoms of diverticulitis are very like those of appendicitis—crampy or steady pain with local tenderness. Fever, loss of appetite, nausea and vomiting may also occur. About 25 percent of patients experience bleeding.

Many attacks are mild and clear up by themselves or in response to medical treatment, such as bed rest and intravenous fluids. Complications such as intra-abdominal abscesses, fistulas, bowel obstruction, and generalized peritonitis require surgery.

There was a time when patients with diverticulosis were advised to eat a soft diet and avoid what is commonly called roughage (bran, whole-grain bread, etc.). Today high-fiber diets are being recommended to prevent the development of diverticula and of diverticulitis.

Irritable bowel syndrome is not a disease, but a disorder of the intestinal contractions by which food and waste are propelled along the GI tract. One of the most common chronic abdominal

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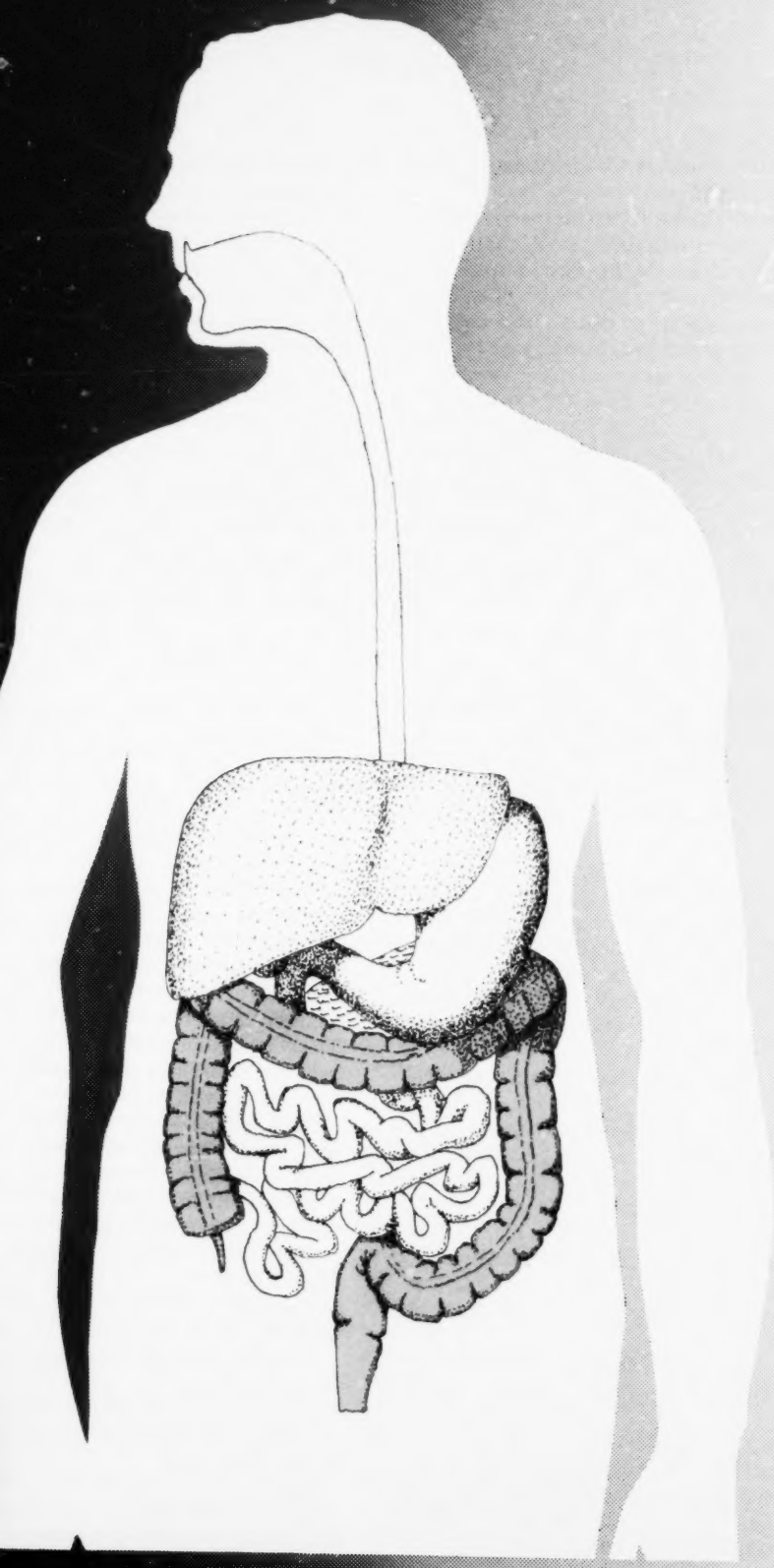


tomy Of The Colon

The convoluted tube called the intestines measures up to 25 feet in an adult. About 20 feet constitute the small intestine, while the remaining five belong to the colon. The diameter of the colon is greater than that of the small intestine, hence its alternative names—large intestine or large bowel. A trip through the colon goes up, over, down and out.

Unlike the small intestine with its many loops and folds, the colon is relatively fixed in position. It consists of four sections. It begins at the cecum, a dilated pouch connecting the small and large intestines. The first section, called the ascending colon, lies in the right side of the abdomen. Making a sharp turn at the liver, the tube becomes the transverse colon, the longest of the four sections. A turn downward at the spleen is the beginning of the descending colon. (We're now on the left side of the abdomen.) This passes into the pelvic area and forms a curving loop called the sigmoid colon. At the very end is the rectum, which is 8 to 10 inches long. The final few inches of the rectum is called the anal region or anus.

The appendix is a long, narrow, worm-shaped tube attached to the cecum. Averaging about three inches in length, this appendage serves no known useful purpose.

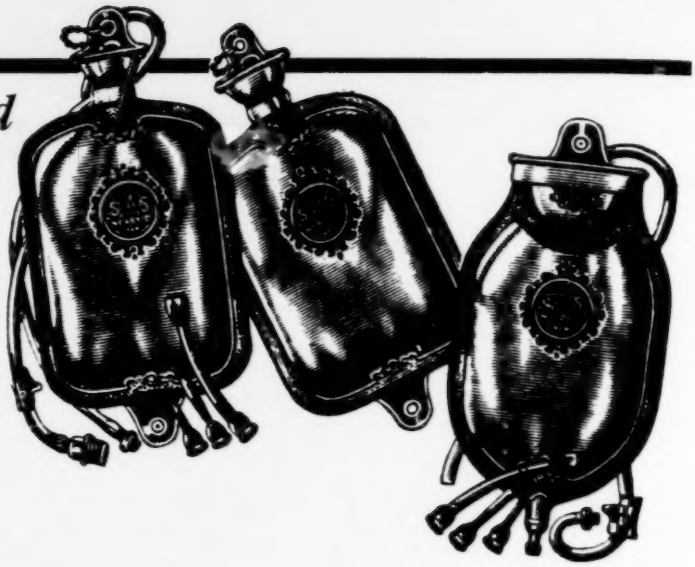
The external muscles of the colon are three bands running from the tip of the cecum to the rectum and converging at the base of the appendix. These muscle bands are actually shorter than the colon itself and tend to draw it into sacs. Separated by folds, the size and shape of the sacs are determined by the contractions of the circular muscles as they move the contents of the intestines along.

The primary functions of the intestines are to extract essential nutrients, fluids and electrolytes (sodium, potassium, chloride and bicarbonate) from food and to dispose of waste residues from the digestive process.

One to two liters of fluid pass through the colon every day. The fluids are absorbed in the ascending and transverse colon. Unabsorbed food substances are reduced to a semisolid substance called feces or stool, which is stored in the descending colon until it is time for defecation. A normal bowel movement begins with the stimulation of receptors in the rectum by the feces. Wave-like muscular contractions propel the stool to the anal canal, from whence it is evacuated.

Aiding in the breakdown of waste products are billions of microorganisms that are the normal residents of the colon. The majority are anaerobic organisms (living without oxygen) that are harmless to their human host. Organisms that can cause disease, such as *Escherichia coli*, hemolytic *Streptococci, Clostridia* and yeast, are also found in the colon, but are far outnumbered and are held in check by the anaerobic microbes—that is, unless some outside influence such as diet, a change in bowel acidity, gastrointestinal disease or drugs (antibiotics) changes the balance of these populations. If harmful bacteria are allowed to grow without control, serious complications can develop.

Use Of Enemas Is Limited



An enema, under the right circumstances, can serve a useful purpose. This procedure, the introduction of fluid into the rectum, is used routinely to prepare patients for surgery, child delivery, X-ray examinations, and sometimes as a laxative.

There are times, however, when some people just go too far with enemas. Despite warnings on product labels, some people overuse enemas under the delusion that they are necessary to maintain "regularity." Too many enemas, like too many laxatives, can lead to a dependence on such products.

Homemade enemas sometimes contain soapsuds that help move impacted feces through their irritant effect. But the American Pharmaceutical Association in its *Handbook on Nonprescription Drugs* doesn't recommend soapsuds. They have been known to cause acute inflammatory reactions in the colon within hours of use. Even more serious are reports of problems such as anaphylaxis, rectal gangrene, acute hemorrhagic colitis, kidney failure, and even death from soapsud enemas.

Another type of enema not recommended by doctors really does go too far in the literal sense. This is colonic irrigation or the high colonic enema. Sometimes used by practitioners of nutritional therapy and non-medical health-care, a high colonic enema involves passing a rubber tube into the colon, via the rectum, for a distance of up to 20 to 30 inches. (An ordinary enema tube is only three inches long.)

Warm water is pumped in and then out, a few pints at a time. As much as 20 gallons may be used before the procedure is completed. Coffee, herbs, enzymes, wheat, and grass extract are often added to the mix, sometimes administered as often as every two hours. All of this is alleged to remove poisons and rot that are supposed to accumulate in the gut, purifying the whole body, as well as the colon. Advocates claim these enemas can relieve all sorts of illnesses, from acne to heart disease and cancer.

There is no scientific evidence that colonic irrigation will do any of these things. The procedure can be dangerous. Deaths have been reported from electrolyte imbalance resulting from repeated coffee enemas. These enemas have led to death from bowel perforation, death of bowel tissue, and toxic colitis.

In 1981 at least 36 cases of amebiasis (an infection caused by an organism called *Entamoeba histolytica*) occurred in patients who had colonic irrigation therapy at a chiropractic clinic in western Colorado. Six of the victims died. Investigation revealed that the irrigation machine was so designed that the same tube that carried the water in also carried fecal material out of the patient. There was no sterilization of the machine or tubing between patients and little mechanical cleaning. This meant that each patient could be inoculated with fecal material from previous patients. Colonic irrigation is not only dangerous to the patient but harms the pocketbook as well. Such economic fraud is not unfamiliar to FDA. One of the most flagrant cases involved one Roy Wright DeWelles, convicted in 1964 for mail fraud in connection with his "Detoxacolon," a pressurized enema device.

DeWelles claimed that the Detoxacolon would cure 38 different diseases, ranging from asthma, anemia, and heart conditions to severe constipation, elongated colons, and cancer. He made an estimated $2.5 million from sales of his devices—more than 200 in a 20-year period—and operation of his own traveling clinics.

From 1957 to 1961 DeWelles operated a clinic in Los Angeles where he treated an estimated 700 cancer patients, using the Detoxacolon and other worthless cancer remedies. The California State Department of Health closed the clinic after finding a 1 in 7 incidence of death after the DeWelles treatment. ■

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problems seen by physicians, irritable bowel syndrome ranks close to the common cold as a cause of absenteeism from work. Women are twice as likely to suffer from this disorder, whites more often than non-whites.

The symptoms are variable, usually including some combination of cramping abdominal pain, constipation or diarrhea, bloating, burning, increased belching and flatulence, nausea, and vomiting. An anatomic cause has not yet been found. What is observed is an abnormal pattern of muscular contractions, including excessive intestinal spasms.

Patients often note that they first experienced a change in bowel movements in adolescence or early adult life. Their symptoms, often appearing after or during periods of stress, follow a constant pattern, though they may vary in severity.

As there is often an emotional factor causing or resulting from this syndrome, reassurance and psychological support play important roles in treatment. Dietary changes may be helpful, along with drugs for temporary relief of symptoms.

Cancer, that most feared of all diseases, attacks the colon with a vengeance. Colon and rectal cancer is the third most common form of cancer among Americans, ranking only behind skin and lung cancer. An estimated 150,000 new cases are diagnosed each year. And 61,500 Americans will die from colon and rectal cancer; that death total is second only to lung cancer. Survival rates are higher when the disease is found before it has spread beyond the wall of the colon.

Most prevalent in people over 40, colon and rectal cancer (or colorectal cancer, as it's called) strikes more men than women. Rates appear to be lower among blacks, Hispanics, and southwest American Indians. Colon cancers also appear to strike many members of the same family.

Symptoms of this type of cancer are blood in the stool (either bright red or black), changes in bowel habits (such as constipation or diarrhea), abdominal discomfort, and pain.

Diagnosis involves a number of procedures, including digital examination of the rectum, direct viewing of the rectum and sigmoid colon with instruments called the proctoscope and sigmoidoscope, X-ray examination, and, thanks to fiberoptics, examination of the entire colon with a flexible colonoscope. This instrument not only permits the identification of colon cancers at an early stage, but it also is equipped with a wire loop to "ensnare," cauterize and remove precancerous polyps or other suspicious growths.

Surgical removal is the primary treatment for colon and rectal cancers. A colostomy may be necessary following surgery, depending on the location and extent of the cancer. Like the ileostomy described previously, a colostomy provides an opening between the colon and the abdominal wall, to permit elimination of body wastes.

Until recently, radiation therapy played a minor role in the treatment of colorectal cancer. However, new research suggests that irradiation before surgery can slow the growth of cancer cells and reduce the risk of the cancer spreading. The use of combinations of anti-cancer drugs (chemotherapy) has been explored in patients with advanced colorectal cancer. New studies are using anti-cancer drugs alone or in combination with radiation soon after surgery to reduce the risk of recurrence of the disease.

There is strong evidence that environmental factors have a role in the development of colorectal cancer. The disease is common in Western industrialized countries, rare in underdeveloped countries. Studies of migrant populations have shown that people who leave areas where there is little colorectal cancer eventually exhibit incidence rates similar to those found in their new homeland.

In view of these findings it has been suggested that diet—particularly one that is high in fat, protein and beef and low in dietary fiber—is a major factor in the development of colorectal cancer. One theory is that the higher the fiber, the less time it takes for the undigested material to move through the colon. Thus, cancer-causing agents have less contact with the bowel lining.

Intestinal polyps, or growths in the colon, are believed to be precursors of colorectal cancer. Most common are adenomatous polyps (those having glandular cell structures), which occur in 2 percent to 15 percent of adults in the United States. Found most often in the rectum and the sigmoid colon, these polyps are usually removed surgically as a preventive measure.

If all these assaults on the colon aren't enough, there are other conditions, such as radiation enteritis, which occurs in 5 percent to 15 percent of patients receiving large doses of radiation for pelvic disorders.

Another is a severe, sometimes fatal, gastrointestinal disease with the fearsome name "pseudomembraneous enterocolitis." This condition is characterized by the formation of oozing plaques attached to the mucosa of the small bowel, colon or both. In the majority of cases, this condition results from exposure to antibiotics, particularly clindamycin, ampicillin and the cephalosporins. Use of these antibiotics alters the microbial balance in the gut, allowing the overgrowth of an organism called *Clostridium difficile.* The toxin produced by this organism causes the colitis, which is marked by severe, persistent diarrhea and abdominal cramps and the passage of blood and mucus. Mild cases may clear up when the offending drug is discontinued. More severe cases usually can be treated successfully with the drug vancomycin. ■

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